

Geology of Coastal Ecosystems Workshop: Making Connections

September 8-10, 1999

Sponsored by: The National Park Service, the U.S. Geological Survey, and the Geological Society of America.

Workshop Report

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Contacts and Further Information

For further information or comments on this report contact:

National Park Service, Geologic Resources Division:	303-969-2090
United States Geological Survey, Coastal and Marine Geology Program:	703-648-6511 or/ 703-648-6069

For additional materials from the Geology of Coastal Ecosystems Workshop, including notebook contents, Coastal Parks Fact Sheets, and field trip information please visit our Website at:

<http://www2.nature.nps.gov/grd/geology>

and click on the link for Coastal and Shoreline Geology.

1.0 Executive Summary

Between the departure of hurricane Dennis and arrival of hurricane Floyd, 120 people gathered on a barrier island off the coast of Maryland to talk about managing dynamic coastal systems. The Geology of Coastal Ecosystems Workshop took place in Ocean City, Maryland, and on Assateague Island National Seashore September 8-10, 1999. The workshop was conceived, designed, financed, and hosted through collaboration among the Geological Society of America's (GSA) Institute for Earth Science and the Environment (IEE), the Geologic Resources Division of the National Park Service (NPS), and the Coastal and Marine Geology Program of the U.S. Geological Survey (USGS). The NPS participants (about 60) came from coastal parks as distant as Alaska and Guam and as near as Assateague. About 40 USGS scientists and administrators, from all coastal regions as well as from the USGS and NPS headquarters offices, participated. Academic participants came from university programs by special invitation from GSA.

The goal of the workshop was to make the connections among: (1) scientific research and resource management, (2) geology and ecosystem management, and (3) National Park System units and external sources of expertise and knowledge. The long-term outcome from these partnership goals are expressed as having geoscientists know what managers need, managers know what geoscientists can provide, and geoscientists and managers know when and how to collaborate. To achieve any of these short-term workshop goals or long-term partnership goals, participants must realize that there is no real demarcation between "basic science" and "applied science."

Sixty-six national park units have coastlines. The Park Service manages an estimated 7,310 miles of coastline distributed among 10 Alaskan coastal parks, 17 Atlantic parks, eight Gulf Coast and Virgin Islands parks, 19 Pacific parks, six Great Lakes parks and six Hawaiian parks. Common themes emerged despite the diversity among park units: the impact of people on coasts and coastal processes; the need for more and easier access to scientific information; centralized sources of information; and, rapid response to short-term needs for scientific expertise. Opening remarks by Department of Interior Deputy Assistant Secretary for Water and Science Mark Shaeffer stressed the importance of integrative approaches to coastal system science and congratulated the group on bringing together scientists from disparate specialties to address coastal management issues. USGS Deputy Director Tom Casadevall (now Central Region director) emphasized the value of joint GSA-USGS efforts to bring together coastal scientists with those who use science to manage lands and resources.

The defining attribute of coastal zones is change, yet we still seek to control coastal processes: to stabilize dunes, to provide quiet waters, to protect our dwellings and businesses. When the system becomes less than gentle, when our shoreline developments fragment habitats with loss of desirable species, we want our shorelines "restored" to some previous state that suits our needs and desires. Coastal park managers are required to make trade-offs in a constant balancing act between socioeconomic demands and geocologic realities forcing land and resource managers into a reactive mode. The better science understands and predicts "what if," and the better that understanding and predictive ability is articulated to decision-makers and problem-solvers, the better able they will be to deal with "what now."

The Geology of Coastal Ecosystems Workshop is also evidence that coastal parks feel the need and have the desire to manage proactively. A proactive management paradigm requires a significantly richer scientific basis for decision-making than a reactive paradigm, as well as public acceptance of managing for change rather than stasis. The workshop organizers and participants feel that we progressed toward articulating both the need for and the opportunities for research in coastal national park units. It is up to the scientific community and to funding sources to hear the need and to respond.

1.1 Interagency needs and efforts identified at the Workshop

There were three recurrent themes that were brought out in the Workshop discussion groups:

1. NPS research needs

- Coastal baseline inventory and monitoring information
- Expanded geologic and biologic mapping, including the mapping of geologic hazards;
- Development of shoreline models that predict future trends and changes;
- Geologic research in coastal parks, both short term (one season or less) and long term;
- Research on impact of increased coastal development and use on coastal parks

2. NPS/USGS/GSA Interagency information transfer and communications

- Improved interagency communications, including outreach, networking, and partnerships
- Expanded information transfer and education, especially from geoscientists to park staff and to park managers

3. NPS/USGS/GSA Interagency program planning and development

- Develop increased scientific input into Park Service planning, including long-range strategic planning, administrative planning such as General Management Plans, and Resource (coastal) Management Plans
- Set national and regional research priorities for multiple parks that consider USGS plans and capabilities
- Identify both existing and new funding sources for coastal geologic research in DOI

1.2 Recommendations and Action Items (for NPS and USGS Managers)

1. Within a year, establish, fund and convene a long term advisory group of 10-20 coastal research scientists and park managers from NPS, USGS and academia to provide oversight and review of inventory and monitoring and research recommendations for the National Park Service. Identify a person from both USGS and NPS with responsibility to facilitate and improve cooperation at the national level. Funding should be 250,000/year starting in 2001.
2. Within two years, the Advisory group should develop a multi-disciplinary and multi-agency strategic plan of inventory and monitoring programs using standard protocols and standard program templates specific to each park, building on the templates developed at Cape Cod National Seashore, at Channel Islands National Seashore and at other parks. These should be modified as needed and revised by the advisory group.

3. The Advisory group should develop an assessment of research needs in the coastal parks based upon: (a) The Fact Sheets from coastal parks prepared for the workshop; (b) Park Resource Management Plans; (c) Investigator's Annual Reports, and, d) USGS strategic and science planning documents.
4. USGS and NPS managers should expand geologic and biologic mapping to include coastal and nearshore NPS environments as the fundamental coastal inventory and monitoring database needed to understand ecosystem change. Goals should be to complete initial NPS coastal mapping and inventory by 2015. Funding is anticipated to be about \$3,000,000/year.
5. USGS and NPS program managers should develop a joint DOI funding initiative for approximately \$5,000,000 annual base funding increase for : (a) the NPS Natural Resource Challenge Program, or (b) the Inventory and Monitoring Program, or (c) the NPS-USGS Coop Projects section of the USGS budget and, (d) the USGS Coastal and Marine Program for use in FY-2002 and beyond.
6. USGS and NPS managers should establish approximately 10 appropriate and unique NPS sites as national standards for monitoring of coastal ecosystem change and restoration success as a basis for long range (100 yr) NPS planning that considers the impacts of global warming, and sea level rise. Agencies should fund associated monitoring and research efforts. Funding requirements are estimated at \$100,000 per site per year.
7. Detail a USGS coastal expert to a coastal park for three to six months to work with the resource management staff.

2.0 Introduction

2.1 Goals, expectations and desired outcomes

The major goals of the Workshop were to bring together scientists, resource managers, park superintendents, and the academic community to make the connections between scientific research and resource management in National Parks Service units, to make connections between geology and ecosystem management and to make connections between park management and staff and external sources of expertise and knowledge such as the U.S. Geological Survey.

The desired outcomes are for geoscientists to understand the needs of resource managers in the parks, and how these geoscientists can provide research products that are useful to managers. Managers must be made aware of the kinds of geologic knowledge that can be usefully applied to ecosystem management. Geoscientists and resource managers need to know when, where, why, and how to contact each other to work toward shared goals.

2.2 Participants mixture

National Park Service participants were from parks having coastlines on the Atlantic Ocean, Gulf of Mexico, Pacific Ocean (including Alaska), inland lakeshores and from Park Service central offices such as regional offices, System Support Offices and Natural Resource Program Centers. Participants represented the needs of their particular park unit as well as regional issues. There were also participants from other federal agencies, especially the U.S. Geological Survey (a cosponsor) state and local agencies, academic institutions, and other interested parties. All participants were urged to participate in the plenary sessions, the breakout sessions, field trip and in informal groups.

2.3 The Workshop processes

The Workshop was designed to begin in a plenary session with an overview of coastal issues followed by examples of specific resource management issues by geographic region (see agenda, below). The plenary session was then divided into breakout sessions representing each geographic region, North Atlantic (and lakeshore), South Atlantic, Gulf of Mexico, Pacific and Alaska. The Breakout Session were to identify common research and information needs. The Workshop participants worked in small groups (20-25) to identify needs common to coastal parks in each region. These formed the basis for formulating cooperative research planning. A second plenary session consisted of reports from each of the breakout sessions followed by discussions on the issues.

One day was set aside for a field trip to Assateague Island to study in the field coastal processes and issues. The field trip was followed by another plenary session for the keynote speaker to refocus the groups and set the stage for another round of breakout sessions. This final breakout was to address five basic issues: (1) Long-term research needs of coastal parks; (2) Short-term needs for technical expertise in coastal parks; (3) Information transfer; (4) Connecting to strategic plans, General Management Plans, and Resource Management Plans; and, (5) Setting priorities.

3.0 Breakout Sessions

3.1 North Atlantic and Great Lakes Parks

3.1.1 Summary

The North Atlantic group discussed specific park units on the Northeast Coast (coastal Virginia, north) and the Great Lakes. These were Acadia National Park, Assateague Island National Seashore, Fire Island National Seashore, George Washington Birthplace National Monument and Sleeping Bear Dunes National Lakeshore. The most significant issues are: the modeling of coastal landslides; invasive and T&E species, both aquatic & terrestrial; dune restoration and stabilization, visitor use impacts; mapping; research; inventory and monitoring; modeling currents and bathymetry (spills); air and water quality, airborne sediment accumulation; interface of geology and biology; wetlands; industrial contamination; collaboration with other agencies; and, information transfer both to the parks and from the parks.

3.1.2 Regional Priority Needs

There should be a collaborative effort between NPS and USGS to set priorities for coastal parks nationally, regionally and park. This effort should be from the bottom up, that is, originating in the field. Analysis should be brought to the park level, bringing science to management. This requires the cooperation of other agencies and with academia. A determination should be made of what a park can do internally and what would require outside expertise.

3.1.3 Recommendations and Action Items

The North Atlantic group identified the following as action items. (1) Get help park by park to define needs, both science needs and interpretive needs, by using a visiting advisory group. This advisory group should be composed of scientists who have knowledge of the area. The group would make independent observations and then meet with park managers and resource specialists. This could be a 3 to 4 day process. (2) Use regional park scientists to direct advisory groups and communicate common needs between parks. This process of setting regional needs would result in an agenda to address needs with collaborators by identifying common needs and priorities. (3) Find a park that is receptive and willing to test this advisory group method and then build on this success. (4) Find an individual to provide continuity in park or region. (5) Feed coastal needs into national initiatives with funding from Interior. As an example develop an initiative with a 5-year plan jointly with the NPS Director, the DOI and the Secretary. Connect this with a National Hazards initiative. Look to agencies outside of Interior for synergy and funding, eg. EPA, NOAA, FEMA, and Corps of Engineers. (6) Have GSA author a booklet describing the value of science to national parks, with superintendents as the target audience. (7) Integrate hydrology, geology and plant ecology together to look for relationships and apply this integrated science to coastal ecosystems. For example, apply the hydrology and geology that is relevant to vegetation favorable for piping plover habitat. Invite all players and disciplines to the table and demonstrate this integration to NPS managers.

3.2 South Atlantic Coastal Parks

3.2.1 Summary

Parks are often managed as "islands," without regard for the surrounding coastal systems as a part of interacting geomorphic units. The "island" management approach allows decisions to be made without trying to partner with other agencies, often leading to inadequate long-term plans. A geomorphic unit approach (e.g. islands, lagoon, mainland, offshore, etc.) is a potentially advantageous way to manage coastal units in the long term.

The South Atlantic group identified several overarching issues that apply to the Park Service units along the South Atlantic coast. These issues are: research needs (both short term and long term); information transfer; connections among strategic planning, general management plans and resource management plans; and, identifying and setting priorities.

3.2.2 Regional Priority Needs

Of major interest identified by this breakout group is the need for short term and long term research in the park. Research priorities include anthropogenic effects, shoreline changes and the need for predictive and statistical models of interactions between fresh water discharge (hydrology) and the marine environment.

3.2.3 Recommendations and Action Items

Park specifically, at Key Biscayne National Park, there is a need for site specific sampling and monitoring protocols for studies of mangroves, sea grasses, bays and estuaries, and coral reefs. Cumberland Island National Seashore has identified a need for shoreline change information for both the ocean and bays, including rates of change, patterns, and trends. Cape Lookout National Seashore requires long term shoreline monitoring, updating inventories and monitoring of the both physical and biological impacts of off-road vehicles and management of GIS and data.

There is a recognized general need to develop methods for long term shoreline monitoring with protocols designed for park staff to do the inventory and monitoring work. There remains a need for technical assistance from within the NPS, other government agencies and from academia. Also, parks should look to their enabling legislation to determine if there is any support for research. Research goals should meet some specific park management objectives.

3.3 Gulf of Mexico Coastal Parks

3.3.1 Summary

The major issues are: strategic planning, coordination with adjacent land owners, consistent research and application, information transfer, funding, coastal resources loss, change in the thinking about barrier island management, global change and sea level rise, and coastal system management plans.

3.3.2 Regional Priority Needs

Strategic planning is needed in order to replace certain infrastructures damaged or destroyed by major storm events, including hurricanes. There is a need for coordination among the various agencies – federal, state, local and private. Research should be standardized and applied consistently. There is a need for a National Coastal Information Center, a central point for gathering, cataloging and indexing research and scientific information.

3.3.3 Recommendations and Action Items

Decisions concerning the relocation of facilities should be based on science and any recommendations should be weighed with social needs and concerns of the adjacent land owners and other interested parties. As a first step in facilitating information transfer and dissemination, there should be more frequent meetings among professionals at the local level. Parks and regions must identify funding sources for both short term (one season or less) research and longer term research. Having identified sources, a mechanism must be established to obtain the available funds. There must be a change in the way barrier island systems and coastal processes are perceived and evaluated, a "paradigm shift" from controlling nature to working in concert with natural processes. There is a pressing need for coastal system or barrier island management plans both locally (park level) and globally (servicewide). These plans should be able to provide managers with the up-front information necessary to make intelligent decisions.

3.4 Pacific Coastal Parks

3.4.1 Summary

The Pacific Group identified the following common needs and issues during the break-out session: baseline monitoring, mapping, developing shoreline change models, outreach, networking, partnerships, and information transfer.

3.4.2 Regional Priority Needs

Needs and issues are for baseline monitoring, geologic hazards mapping, basic geologic mapping, shoreline models, and outreach, networking, and partnerships.

3.4.3 Recommendations and Action Items

First, there needs to be an understanding of how the U.S. Geological Survey and other agencies and organizations set their funding priorities. This is critical in determining which project proposals will be more successful and will meet the needs of each partner. Second for better communications and dissemination of information, establish and maintain a web site devoted to coastal park issues. Parks need to develop and have available Resource Management Projects (RMPs) for coastal studies and coastal projects. Therefore, RMP statements should be made available on the web. Third, establish clear contact points among parks, other federal agencies, state agencies, and colleges and universities. Fourth, coastal parks should meet periodically at

regional and national Park Service resource management meetings. Fifth, There needs to be timely notification of national initiatives. The NPS should tie into the NOAA National Coastal Monitoring Initiative or create a coastal parks initiative.

3.5 Alaska Coastal Parks

3.5.1 Summary

The Alaska Breakout group identified the five categories: (1) Long-term research needs of coastal parks; (2) Short-term needs for technical expertise; (3) Information transfer; (4) Connecting to strategic, administrative and, resource management plans; and, (5) Setting priorities.

3.5.2 Regional Priority Needs

There is a need for additional planning and interactions to refine regional priorities. This could at least be partially accomplished with a national advisory panel. A first step is to develop contacts and links to the research community and interested "experts" both within Alaska and elsewhere. Second, develop an ad-hoc advisory committee to help determine and set realistic achievable goals.

3.5.3 Recommendations and Action Items

Both long-term and short-term research needs are for shoreline and coastal mapping, coastal inventory and monitoring of the resources, and studies of coastal water quality and circulation. Coastal mapping and monitoring provides baseline data to determine shoreline change including rates of erosion, shoreline stability, and the extent of ice cover and movement of glaciers. An inventory of coastal resources provides baseline data to help determine the coastal susceptibility to pollution, the type and potential for geologic hazards such as the potential of tsunami impacts to the southeast coast and, land use and visitor impacts on the resources. Studies of coastal water quality and circulation, including upland hydrology, provides data regarding the impacts and recovery from the Exxon Valdez oil spill as well as other past, present, and potential sources of water pollution.

Research and communications must be linked to strategic planning, administrative plans such as General Management Plans and to Resource Management Plans. There is a need for additional planning and interactions to refine regional priorities. This could at least be partially accomplished with a national advisory panel which could develop contacts and links to the research community.

4.0 Summary of Workshop Activities

4.1 Agency Roles, Responsibilities and Funding Opportunities.

4.1.1 United States Geological Survey Coastal and Marine Geology Program

The United States Geological Survey (USGS) develops reliable scientific information describing the earth in order to minimize losses from natural disasters and to help manage natural resources such as water, biological resources, energy, and mineral resources. The Geologic Division (GD) of the USGS developed a strategic plan (<http://pubs.usgs.gov/circular/c1172/>) that identifies an integrated mixture of monitoring, research, and assessment activities in support of seven major science goals. These seven science goals specifically address geologic hazards and disasters, climate variability and change, energy and mineral resources, ecosystem and human health, and ground-water availability. The primary customers of USGS services are other DOI agencies.

The Geologic Division places an emphasis on developing a broad understanding of the interactions between humans and the Earth. This emphasis necessitates an increased focus on understanding active geologic processes and events (from the commonplace to the catastrophic) and the use of models to predict their frequency and effects. These predictive models will be science-based scenarios and assessments identifying a range of possible consequences that should be incorporated into policymaking and land management decisions. The science strategy places emphasis on interdisciplinary research, acknowledging the importance of crossing traditional discipline boundaries in investigating complex Earth systems.

The USGS Coastal and Marine Geology Program (CMGP) in the Geologic Division is a \$35-40M effort to describe coastal geologic systems in order to understand the fundamental processes that create, modify and maintain these systems. With this is an effort to develop predictive models that provide understanding of natural systems and the effects of man's activities on them, and to provide a capability to predict future change. (<http://marine.usgs.gov/>) The program addresses issues of national importance in the areas of environmental quality and preservation, natural hazards and public safety, and natural resources, providing information and comprehensive understanding of marine and coastal geology for public benefit. The program will provide information and products in of both the oceanic and Great Lakes coastal domains.

The Coastal program along with other Geologic Division programs (earthquakes, minerals, energy, volcanoes, geologic mapping, earth surface dynamics) develops a unified prospectus in January and February each year that calls for continuing work plans and new proposals from USGS staff. NPS national, regional and park specific interests, needs and issues should be communicated to the Program Coordinator and to potential USGS partner scientists at one of the three regional Teams (<http://marine.usgs.gov/>) for development of USGS staff links and for potential incorporation in the following fiscal year's prospectus. Project development in CMGP is commonly a coordinated effort among staff scientists, program offices and partner agencies (e.g. Cape Cod, Sleeping Bear Dunes, Biscayne Bay, Channel Islands, Glacier Bay). Proposals and work plans are due at the end of spring. Project and funding decisions are generally 90% complete at the start of the new fiscal year. The key is to link park specific issues with CMGP staff capability and interest in accordance with CMG Program direction and funding priorities.

4.1.2 National Park Service

The National Park Service (NPS) was created by the Organic Act of 1916 “...to conserve the scenery and the natural and historic objects and the wildlife therein...” Each NPS unit has enabling legislation that provides specific direction from Congress as to how the unit is to be managed. General Management Plans (GMPs) and Resource Management Plans (RMPs) provide a framework for the management of each park. Park staff manage the resources and provide services for the visiting public. By necessity most of the resource management in parks is conducted by generalists rather than scientists with specialized expertise.

The NPS Geologic Resources Division (GRD) is part of the Natural Resources Program Center (NRPC), located in Denver/Ft. Collins, Colorado. The Division is developing a coastal geology program focusing on facilitating geologic data collection, research, inventory and monitoring, interpretation, and technical assistance for the 62 coastal (marine and lakeshore) NPS units. The program will be implemented through partnerships with the U.S. Geological Survey, state geological surveys, universities and the geologic community. These partnerships should provide access for the specialized expertise to meet the service’s needs.

There are new funding opportunities available for research and studies in coastal parks. The NPS is in it’s first year of a five-year planned funding increase to implement it’s Natural Resource Challenge (NRC) program. The new funding is directed at specific elements in the NRC that apply to coastal parks. Monies have been established for inventory and monitoring natural resources, determining baseline information, observation of vital signs indicators, creating Cooperative Ecosystem Study Units (CESU)s at universities and acquiring additional diverse NPS staff with scientific expertise. Additionally the NPS science project fund (NRPP) has been increased. Through the fee collection process, the parks have been allowed to retain a portion of these monies for specific park projects, while central offices have been authorized to spend a portion of this revenue on regional and servicewide projects.

4.1.3 Geological Society of America

The Geological Society of America is a scientific society serving approximately 16,000 members in the United States and abroad. Its mission is to advance the geosciences, to enhance the professional growth of its members, and to promote the geosciences in the service of humankind.

The Institute for Earth Science and the Environment (IEE) carries out strategic goals for The Geological Society of America. Dr. Cathleen L. May directs IEE through the GSA Science and Outreach Center. The mission of the Institute for Earth Science and the Environment is to provide for effective interactions between geoscience and society. IEE programs support the use of quality geoscience in addressing societal challenges by promoting: (1) the geosciences in partnership with life, atmospheric, planetary, social, and economic sciences to better understand Earth as a complex system; (2) the geosciences as critical to the effective management of healthy ecosystems; (3) the geosciences as integral to global efforts for sustainable resource development, management, and use.

IEE operates as an institution that deploys expertise and acts in partnership with other institutions and organizations. The IEE Director sits on a variety of national committees and task forces involved in connecting geoscience to societal concerns, policy and decision-making, and environmental challenges. IEE also provides opportunities for geoscience professionals to involve themselves in its efforts.

IEE encourages the development of integrative, collaborative research programs to address environmental challenges. IEE efforts in this arena are carried out in collaboration with like-minded partners including: the U.S. Geological Survey, the Ecological Society of America, federal land management agencies, sibling geoscience organizations, and academic institutions. IEE also offers a variety of venues including workshops, round-tables, technical sessions, and symposia on integrative science in conjunction with GSA's annual meeting and Section meetings. IEE Mentor Programs such as the Mann Mentorship in Applied Hydrogeology and the Shlemon Mentor Program in Applied Geology provide opportunities for applied geoscientists to share their professional and personal experiences with undergraduate and graduate students and faculty. These programs help bridge the gap which commonly exists between academic and applied geoscientists.

IEE provides and administers the GSA National Park Service Summer Internships. These provide opportunities for undergraduate geoscience students to become actively involved with educational and resource management activities within individual national park units. Geoscience interns in park units help to build public and agency awareness of the importance of geology to land and resource management.

4.2 Keynote addresses

4.2.1 Geology of Coastal Ecosystems Keynote Address Integrated Science and Coastal Ecosystem Management

Mark Schaefer

Acting Assistant Secretary – Water and Science
U.S. Department of the Interior

What use can science have in the running of the National Parks? The question is best answered by a quote from the NPS itself. “[I]n addition to the use of science as a means to improve park management, parks can and should be centers for broad scientific research and inquiry.” In particular, the science must be fully integrated among various disciplines. Successful ecosystem management is dependent upon multidisciplinary approaches to science. The key is undertaking physical, biological, and social science together.

This requires moving beyond the traditional approaches of individual disciplinary studies, reductionist approaches, and pursuing the scientifically interesting as opposed to the scientifically necessary. The challenge will be to link the physical, biological, & social sciences, to encourage holistic ecosystem studies and to provide resource managers useful information.

There exists a gap, or more properly a canyon, between management and science. It results from problems in communicating needs and opportunities, transferring information, and finding financial support. A bridge needs to be built over this canyon that would establish better lines of communication, have managers better communicating needs, and have scientists better communicating possibilities.

The tool of adaptive management holds great promise for integrated science. In this theme, management exists as a continuing experiment, with flexible management approaches capable of adjusting with new information. Strong monitoring approaches are essential. One example would be the Grand Canyon/Glen Canyon Adaptive Management Process, which includes an Adaptive Management Working Group and the Grand Canyon Monitoring & Research Center.

What is the value of integrated science particularly in protected areas? Parks and refuges are semi-intact, “natural” landscapes, although it is often a struggle to define what is or was “natural”. Integrated science can aid restoration in non-protected areas by answering the question, “What do we restore to?” Parks represent islands of nature in a sea of development, and provide the opportunity to conduct scientific research in relatively pristine areas.

Several initiatives are underway to promote integrated science. There is the STC/Committee on Environment and Natural Resources: Integrated Science for Ecosystem Challenges (ISEC) initiative. The “New” USGS will form closer ties with universities through competitive grants & cooperative agreements; through a greater focus on DOI science priorities, through partnering with others, and with an ecosystem approach to science. Critical to these initiatives success is the formation of Cooperative Ecosystem Study Units (CESUs). These provide a mechanism to

promote multidisciplinary, collaborative research in a university setting. They will be a multi-agency federal activity involving NPS, USGS, BLM, USFS, DOE, and other agencies. So far, four CESUs have been recently announced including the North Atlantic Coast (University of Rhode Island as host). Competition in other regions will be announced shortly.

The CESU has five key elements:

- A host university
- partner institutions and federal agencies
- role and mission statement
- a managers committee
- strategic plan and annual work plans

Technological advances have provided emerging tools that enable integrated science. These include geographic information systems (GIS); the Internet and World Wide Web, and global positioning systems (GPS). Decision support systems (DSS) then combine GIS, GPS, analytical tools, and visualizations that help link managers and scientists and facilitate public understanding and participation in decision-making processes.

Of particular interest to this workshop are interactions between the USGS and NPS. Specifically, the two agencies have undertaken fundamental environmental studies, hazard investigations, resource identification, and interpretive programs.

An example of a fundamental environmental study would be present work in Massachusetts Bay. Here the agencies work together to predict the fate of sediments and contaminants. They are actively pursuing sea floor mapping, sediment monitoring, and circulation models. These data have been used to site activities, plan monitoring activities, and understand effects of alternatives

Sleeping Bear Dunes National Lakeshore has an extensive program investigating geologic hazards. A large slide in 1995 dropped a significant portion of the lakeshore into the lake. Fluid pressure is thought to be the cause. The research results can help identify times of danger, allowing a public warning, and provide insights into the effects on aquatic life.

Coastal hazards threaten many resources. They have required the relocation of the Cape Hatteras Lighthouse. Research studies provide base-line information and model data for quick (storm-induced) and gradual (climatic) changes, and can be used for decisions on relocating structures and assessing wildlife impacts.

Finally, the park interpretive programs provide an excellent forum for disseminating integrated science and research to the public and have the additional benefit of helping resource managers make use of information. One resource for this information is the Internet, at the USS/NPS Geology Interpreter's web site.

4.2.2

Geology of Coastal Ecosystem Keynote Address Making Connections

Thomas Casadevall
Deputy Directory, USGS

The United States Geological Survey serves the Nation by providing reliable scientific information to describe and understand the Earth; to minimize the loss of life and property from natural disasters; to manage water, biological, energy, and mineral resources; and, to enhance and protect the quality of life.

The USGS has a nationally distributed, multidisciplinary workforce of scientists, capable of developing, designing, and maintaining long-term national and international databases, and conducting short and long term, broad-scale, interdisciplinary studies and research. Their goal is to provide integrated science for the Department of the Interior agencies.

The National Park Service recently initiated a Natural Resource Challenge, seeking to “preserve our natural resources far into the future, which now requires active and informed management based on sound science” (From Robert Stanton, Director, National Park Service). This NPS Challenge dovetails neatly with the USGS strengths and goals.

Focusing on specific coastal and shoreline issues, we experience some natural processes as human disasters. A case in point would be the recent hurricanes, which pounded the southeast and Gulf coasts. While many would describe these storms as destructive, we should not ignore that “a hurricane is part of the ecosystem. It keeps everything in balance” (Jock Whitworth, Superintendent, Padre Island National Seashore).

Factors and processes affecting coastal land loss and accretion include an area’s geologic and geomorphic character and framework, eustatic sea-level change, land subsidence or uplift. Routine coastal processes, including catastrophic storm events and shelf sedimentation budgets, can profoundly effect human activity and experiences along shorelines. The impacts of these processes include storm-surge flooding, shoreline erosion, and high winds. Much larger scale geologic processes, not localized along a specific area, also can severely effect coastal regions. These include earthquakes and associated tsunamis and landslide, volcanic activity, long-term chronic coastal erosion, changes in worldwide sea levels, and both global and regional climatic change.

Integrated information is the key to understanding and addressing these impacts. Information is needed in land and water sustainability, hazards, species and their habitats, land resources and environmental change, river and aquifer management, land and water restoration, and non-renewable resources. The USGS and National Park Service combined effort can be instrumental in attaining this information.

4.2.3 Geology of Coastal Ecosystems Keynote Address

An Overview of the Characteristics of Coastal National Parks

Dr. Suzette Kimball
Regional Chief Biologist
United States Geological Survey

Dr. Kimball provided an overview of the coastal parks, common and distinct characteristics of coastlines in different areas, and their linkage to wave height. Coastal erosion is a characteristic common to nearly all of the regions, with rates of erosion ranging from steady state to severe. The shorelines of the northeast region parks, from Acadia National Park to Fire Island National Seashore, are characterized by:

- Moderate to high tide range
- Moderate wave heights and surf
- Glacial imprint
- Rocky shorelines and barrier islands
- Proximity to population centers
- Coastal erosion of sandy beaches

The shorelines of the Mid-Atlantic Bight, from Fire Island National Seashore to Cape Lookout National Seashore are characterized by:

- Long linear sandy barriers/wide sounds
- Moderate tidal range and wave climate
- Extra-tropical storms dominate
- Proximity to population centers
- Overwash processes
- Sediment deficit
- Coastal erosion

The shorelines of the southeast coast, from Cape Lookout National Seashore to Everglades National Park, are characterized by:

- High tide range
- Low wave climate
- Inlet & tidal creek/wetlands systems
- Hurricane impacts
- Relatively distant from high population
- Coastal erosion

The shorelines of the Gulf of Mexico coast, from Everglades National Park to Padre Island National Seashore, are characterized by:

- Low wave heights
- Barrier coasts
- Wetlands
- Mississippi River influence
- Hurricane impacts/overwash
- Coastal erosion
- Oil, gas, and water withdrawal

The shorelines of the Pacific Coast, from Cabrillo National Monument to Olympic National Park, are characterized by:

- High tide range
- Large wave heights and surf
- El Niño impacts (storms & water temp)
- Cool/cold water temperatures
- Prominent river mouth bar/lagoon systems
- Steep rocky or sandstone cliffs
- Sediment deficit
- Coastal erosion

The shorelines of the tropical parks, including the Caribbean parks and Pacific Ocean parks, are characterized by:

- Low tide range
- Reefs and sandy pocket beaches
- Hurricane impacts
- Limited sand supply
- Reef ecosystems
- Volcanic imprint
- Coastal erosion

The shorelines of the Great Lakes parks are characterized by:

- Variable basin characteristics
- Water level variability
- Short period waves
- Storm impacts
- Ice and Aeolian processes
- Coastal erosion

The shorelines of Alaska's parks, extending from Glacier Bay National Park to Cape Krusenstern National Monument, are characterized by:

- High tide range
- Large wave heights
- Ice and glacial imprint
- Extra-tropical storm impact
- Tsunami impacts

4.3 Field Trip Discussions

The second day of the Workshop was a field trip to Assateague Island National Seashore and vicinity, using the local coastal ecosystems as a discussion topic. The stops were organized around four different themes to demonstrate the ecosystems and processes. The starting points for field discussion of national NPS issues were:

- Urban and developed ecosystems: Ocean City Inlet and barriers island
- Lagoonal ecosystems: Assateague Island lagoon shore
- Beach ecosystems: Assateague Island ocean shore
- GIS and interpretative products - Assateague Island National Park Visitors Center

Each stop was staffed by an interdisciplinary "discussion team": a geologist, an ecologist or geo-ecology-type, and a resource manager. The team presented a systemic view of the geological and ecological interactions of the "habitat-type" at that stop, along with resource and habitat management issues (see Appendix C.2.2). The teams were being asked to coordinate their presentation material so that they offer cohesive, interdisciplinary guidance and discussion material at each stop. We attempted to move beyond "presenting" a disciplinary field lecture to an audience of participants and onto guiding the group toward questions and discussion about geological/ecological interactions, resource management issues, as well as the geological and biological science that is needed to address them. We also hoped to stimulate participant discussion on how geology can be applied to management.

Appendices

Appendix A. Workshop information

Appendix A.1 Workshop agenda

DAY 1, Wednesday, September 8, 1999

The Need for Connections

		<u>OPENING REMARKS</u> [Heise moderator, Barnes timekeeper]
8:00 - 8:10	I.	Welcome Superintendent of Assateague
8:10- 8:25	II.	Introduction Cathleen May
		<u>Goals of the Workshop: To make connections:</u>
		<ul style="list-style-type: none"> • between <i>research</i> science and <i>resource</i> management • between geology and ecosystem management • between parks and external sources of expertise and knowledge
		<u>Desired Outcomes:</u>
		<ul style="list-style-type: none"> • Geoscientists understand resource managers' needs, and how to provide research products that are useful to managers. • Managers understand the kinds of geologic knowledge that can be usefully applied to ecosystem management. • Geoscientists and resource managers know when, where, why, and how to contact each other to work toward shared goals.
8:25 - 8:45		Keynote address: Integrating the geological sciences into coastal ecosystem management. Speaker: ?
		<u>COASTAL NATIONAL PARKS</u>
8:45 - 9:05	I.	Overview of Coastal National Parks: the Context <i>General description of coastal parks' natural setting by geographic region</i>
9:05 - 9:35	II.	Resource Management Issues <i>Examples of specific resource management issues by geographic region.</i>
		<ul style="list-style-type: none"> • Atlantic • Gulf/Caribbean
9:35 - 9:50		Break
9:50 –10:35		Resume Session
		<ul style="list-style-type: none"> • Pacific • Alaska • Inland Lakeshores/Reservoirs
10:35 – 11:45	III.	Breakout Session: Identifying Common Research and Information Needs: <i>Workshop participants work in small groups to identify needs common to coastal parks in each region. These can form the basis for formulating cooperative research planning.</i>
		For example:
		<ul style="list-style-type: none"> • Need: baseline inventories of physical/geological, biological, cultural resources. • Need to: document and monitor shoreline changes. • Need to understand: effects of physical shoreline changes on biological and social components of ecosystems.
11:45 – 1:00		Lunch
1:00 - 2:00	IV.	Plenary Session – Reports from break-outs and subsequent discussions

PARTNERSHIPS: MEETING THE NEEDS

2:00 - 2:30	I. Organizational Overviews <i>Mission, organizational structure, funding structure, program an, interests, capabilities, and needs; identify existing organization links and mechanisms for partnering</i> <ul style="list-style-type: none">• National Park Service• US Geological Survey
2:30 - 2:40	Discussion
2:40 - 3:00	Break
3:00 - 4:10	II. Extended Partnerships: Common Need and Shared Responsibility <i>How can these organizations assist with the items discussed at the workshop so far? How do these organizations interact with the public?</i> <ul style="list-style-type: none">• Geological Society of America• US Fish and Wildlife• NOAA• Corps of Engineers• State Surveys• Academia• Non – government organization
4:10 - 4:30	Discussion
4:30 - 5:00	Interpreting Park Geology for the Public - examples from the USGS and NPS - Melanie Marino
6:00 – later	Social Mixer

Day 2, Thursday, September 10, 1999
Field Day: Seeing the Connections

- 8:00 - 3:00
 (see schedule below)
- ASSATEAGUE ISLAND**
Case study: Geology of a barrier island ecosystem, related research, issues and needs. Participants will visit four sites that illustrate specific aspects of each heading below.
- I. Physical setting of the Barrier Island Ecosystem**
- II. Ecosystem management Issues at Assateague**
- III. Coastal (physical) Processes of the Ecosystem**
- IV. Geological Monitoring Program**
- 3:30 - 5:30
VIRTUAL FIELD TRIP
Aspects of other types of coastal parks' habitats and ecosystems presented at hotel through multi-media displays.
- Glacial
 - Offshore
 - Coral Reefs
 - Cliffs and Bluffs
 - Estuaries
- 6:00 – later
DINNER
Guest speaker: coral and coral island geoecosystems

Field Trip Schedule

Group/Time	8 - 9	9 - 10	10 - 11	11 - 12	12 - 1	1 - 2	2 - 3	3:00
A	1	TR	5	2	3	4	TR	Hotel
B	1	TR	2	5	4	3	TR	Hotel
C	TR	5	4	3	2	TR	1	Hotel
D	TR	2	3	4	5	TR	1	Hotel

Stations

1 - North Inlet, Ocean City Side

2 - Lagoon Site

3 - Dune Site

4 - Beach Site

5 - Visitor Center

TR - Travel

Lunches are sack lunches and can be eaten on demand

DAY 3, Friday, September 11, 1999
Getting Connected

8:00 - 8:30

PLENARY SESSION 1

Synthesis of Days 1 and 2

Keynote Speaker will refocus group and set the stage for the next session.

8:30 – 11:00

BREAKOUT SESSION: PRODUCING RESULTS

Participants will break into the same interdisciplinary groups (geoscientists, resource managers, others) based on Wednesday's geographic regions and address the topics listed below. Topics may be modified based on synthesis from plenary session.

- I. Long-term Research Needs of Coastal Parks**
 - Statement of need
 - Action items
 - Potential partnerships
- II. Parks' Short-term Needs for Technical Expertise**
 - Statement of need
 - Action items
 - Potential partnerships
- III. Information Transfer**
 - Statement of need
 - Action items
 - Potential partnerships
- IV. Connecting to Strategic Plans, General Management Plans, Resource Management Plans**
 - Statement of need
 - Action items
 - Potential partnerships
- V. Setting Priorities**
 - Criteria For Setting Regional And National Priorities
 - Ecosystem Priorities
 - Political Priorities
 - Action Items

PLENARY SESSION 2

11:00 – 12:00

I. Reports from Break-outs

12:00 – 1:00

II. Synthesis and Group Decisions

Next Steps

Getting the Word Out

Roles and Responsibilities

1:00

SUMMARY AND SEND-OFF

Appendix A.2 Participant names and affiliation

North Atlantic Breakout Session

Mark Duffy, NPS (Assateague Island National Seashore)
Carl Zimmerman, NPS (Assateague Island National Seashore)
Bob Krumenacker, NPS (Northeast Region)
Michael Marion, NPS (Acadia National Park)
Rick Morawe, NPS (George Washington's Birthplace National Monument)
Janet Wise, NPS (Boston Support Office)
Danette Woo, NPS (Fire Island National Seashore)
Steve Yanco, NPS (Pictured Rocks National Lakeshore)
Jim Allen, USGS (Boston)
Deborah R. Hutchinson, USGS (Woods Hole, MA)
Bruce Jaffe, USGS (Menlo Park)
Charles Roman, USGS (Patuxent Wildlife Research Center, RI)
Bob Shedlock, USGS (Coastal & Marine Geol., Menlo Park)
Gregory Bass, COE (Baltimore District)
Scott Johnson, COE (Baltimore District)
Randolph McBride, George Mason Univ., Fairfax, VA
Maria Honeycutt, Univ. Delaware, College Marine Science
Jon Boothroyd, University of Rhode Island
Emery Cleaves, University of Maryland
Paul k. Doss, Univ. of Southern Indiana
Kenneth Hinga, Univ. Rhode Island, Oceanography
David E. Krantz, University of Delaware
Virginia Lee, University of Rhode Island
Susan McGeary, University of Delaware
Allison Thomson, NOAA (Coast Survey Development Lab, MD)

South Atlantic Breakout Session

Suzette Kimball, USGS (facilitator)
Jenny Bjork, NPS (Cumberland Island)
Jeff Cordes, NPS (Cape Lookout)
Brian Lockwood, NPS (Biscayne)
Pat Lynch, NPS (Biscayne)
Bob Newkirk, NPS (Canaveral)
Sue Suska, NPS (Cape Lookout)
Robert Brock, NPS (Everglades)
Bob Higgins, NPS (Geologic Resources Division)
Jeff Williams, USGS (Reston, Marine Geol Prog.)
Jack Epstein, USGS (Reston)
Dan Stauble, USGS/COE (Vicksburg)
Paul Barlow, USGS (Northborough)
Tracey Rice, FWS (Raleigh, NC)

Woody Hobbs, VIMS (Virginia Institute of Marine Science)
Laura Guertin, Mary Washington College, Virginia
John Wehmiller, University of Delaware
Wendy Carey, Marine Advisory Service
Beth Christenson, Rurman College, South Carolina
Donald Young, Virginia Commonwealth Univ. Richmond, Va

Gulf Coast Breakout Session:

Rick Harris – NPS (Rocky Mountain Region), facilitator
Larry Norris – NPS (Rocky Mountain Region), scribe
Diane Gese – NPS (Geologic Resources Division), recorder
Riley Hoggard – NPS (Gulf Islands National Seashore)
Leslie Krueger – NPS (Water Resources Division)
Mark Nicholas – NPS (Gulf Islands National Seashore)
Ellen Raabe – USGS (Coastal & Marine Geology Prog., St. Petersburg)
Lisa Robbins – USGS (Coastal & Marine Geology Prog., St. Petersburg)
Jock Witworth – NPS (Padre Island National Seashore - Supt.)
Martha Garcia – USGS (Reston)
Joan Pope – COE (Vicksburg)
Robert Halley – USGS (Coastal & Marine Geology Prog., St. Petersburg)
Anthony Frank – USGS (Kearneyville, WV)
Gary Hopkins – NPS (Gulf Islands National Seashore)
Colleen Dunlevy – Dynamic Corporation
Sid Covington – NPS (Geologic Resources Division)
Darell Echols – NPS (Padre Island National Seashore)

Pacific Breakout Session

John Brock, USGS (Coastal & Marine Geol., St. Petersburg)
Bill Gleason, NPS (San Juan Island National Historical Park)
Michael Carr, USGS (Menlo Park)
Karen Gustin, NPS (War in the Pacific National Historical Park)
Mietek Kolipinski NPS (Pacific-Great Basin Support Office)
Vicki Osaki, NPS (Redwood National Park)
Dan Richards, NPS (Channel Islands National Park)
Tom Casadevall, USGS (Reston)
Chuck Sayon, NPS (War in the Pacific National Historical Park)
Dave Schirokauer, NPS (Point Reyes National Seashore)
Guy Cochrane, USGS (Coastal & Marine Geol., Menlo Park)
John Dinger, USGS (Coastal & Marine Geol., Menlo Park)
Jan Hren, USGS (Reston)
Bonnie Murchey, USGS (Coastal & Marine Geol., Menlo Park)
Tamara Williams, NPS (Golden Gate National Recreation Area)
Jim Wood, NPS (Geologic Resources Division)
John Wullschleger, NPS (Olympic National Park)

Alaska Breakout Session

Peter Armato, NPS (Kenai Fjords National Monument)
Amanda Austin, NPS (Katmai National Park)
Peter Barnes, USGS (Menlo Park)
Larry Basch, NPS (Glacier Bay National Park and Preserve)
Walter Barnhardt, USGS (Menlo Park)
Jon Boothroyd, University of Rhode Island)
John Bundy, NPS (Katmai National Park and Preserve)
Paul Carlson, USGS (Menlo Park)
Lois Dalle-Molle, NPS (Western Arctic National Parkland, Kotzebue)
Nancy Deschu, NPS (Alaska Regional Office)
David A. Greene, USGS (Reston)
Curt Mason, NOAA (Silver Spring, MD)
Mary-Beth Moss, NPS (Glacier Bay National Park and Preserve)
Lewis Sharman, NPS (Glacier Bay National Park and Preserve)
Allison Thomson, NOAA (Silver Spring, MD)

Appendix B Coastal Parks NPS/USGS Contacts

(POC = Point of Contact)

Alaska Coastal Parks

Aniakchak National Monument & Preserve – POC: Peter Armato (907) 224-2113

P.O. Box 7

King Salmon, AK 99613

Superintendent: Deb Liggett (907) 257-3751

Chief of Resource Mgmt: Rick Clark (907) 246-2123

Chief of Interpretation: Mark Wagner (907) 246-2122

USGS Contact: Terry Keith tkeith@usgs.gov (907)-786-7443

Bering Land Bridge National Preserve – POC: Dave Spirtes

P.O. Box 220

Kotzebue, AK 99762 (907) 442-3890

Superintendent: Dave Spirtes

Chief of Natural Resources: Lois Dalle-Molle

USGS Contact: Allison Till atill@usgs.gov (907) 786-7444

Peter Barnes pbarnes@usgs.gov (650) 329-5265

Cape Krusenstern National Monument – POC: Dave Spirtes

P.O. Box 220

Kotzebue, AK 99762 (907) 442-3890

Superintendent: Dave Spirtes

Chief of Natural Resources: Lois Dalle-Molle

USGS Contact: Curt Larsen clarsen@usgs.gov (703) 648-6664

Glacier Bay National Park & Preserve – POC: Larry Basch, Ph.D. (907) 697-2230

Ecologist/Coastal Manager

Alaskan Southeastern Coastal Parks Cluster

P.O. Box 140

Gustavus, AK 99826 (907) 697-2622

Chief, Resource Mgmt: Mary Beth Ross (907) 697-2640

GIS Specialist: Bill Eichenlaub (907) 697-2230

USGS Contact: Paul Carlson pcarlson@usgs.gov (650) 329-5278

Sue Karl skarl@usgs.gov (907) 786-7428

Katmai National Park and Preserve – POC: Peter Armato (907) 224-2113
P.O. Box 7
King Salmon, AK 99613
Superintendent: Deb Liggett (907) 257-3751
Chief of Resource Mgmt: Rick Clark (907) 246-2123
Chief of Interpretation: Mark Wagner (907) 246-2122
USGS Contact: Terry Keith tkeith@usgs.gov (907) 786-7443

Kenai Fjords National Park – POC: Peter Armato (907) 224-2113
P.O. Box 1727
1212 4th Avenue
Seward, AK 99664
Superintendent: Anne Castellina (907) 224-3175
Chief Resource Mgmt.: Jeff Troutman
USGS Contact: Monty Hampton mhampton@usgs.gov (650) 329-5065
Peter Haeussler pheuslr@usgs.gov (907) 786-7447

Klondike Gold Rush National Historical Park – POC: Larry Basch, Ph.D. (907) 697-2230
Ecologist/Coastal Manager
Alaskan Southeastern Coastal Parks Cluster
P.O. Box 140
Gutavus, AK 99826 (907) 697-2622
USGS Contact: Paul Carlson pcarlson@usgs.gov (650) 329-5278
Sue Karl skarl@usgs.gov (907) 786-7428

Lake Clark National Park & Preserve – POC: Peter Armato
4230 University Drive, Suite 311
Anchorage, AK 99505
USGS Contact: Terry Keith tkeith@usgs.gov (907) 786-7443

Sitka National Historical Park – POC: Larry Basch, Ph.D. (907) 697-2230
Ecologist/Coastal Manager
Alaskan Southeastern Coastal Parks Cluster
P.O. Box 140
Gustavus, AK 99826 (907) 697-2622

Wrangell-St. Elias National Park & Preserve – POC: Devi Sharp
P.O. Box 439
Copper Center, AK 99574 (907) 822-5234
Superintendent: Hunter Sharp
Chief of Resources: Devi Sharp (907) 822-7236
Ecologist/Coastal Mgr: Larry Basch, Ph.D. (907) 697-2622
USGS Contact: Gary Winkler gwinkler@usgs.gov (303) 236-9674

Atlantic Coast Parks

Acadia National Park – POC: David Manski

P.O. Box 177

Bar Harbor, ME 04609

Superintendent:	Paul F. Haertel	(207) 288-0374
Chief of Resource Mgmt:	David Manski	(207) 288-5463
Chief of Interpretation:	Deb Wade	(207) 288-5459
GIS Specialist:	Karen B. Anderson	(207) 288-5463
USGS Contact:	Walter A. Barnhardt wbarnhardt@usgs.gov	(650) 329-5181
	Carl Koteff ckoteff@usgs.gov	(703) 648-6924

Assateague Island National Seashore – POC: Carl Zimmerman

7206 National Seashore Lane

Berlin, MD 21811

Superintendent:	Marc Koenings	(410) 641-1443 ext. 209
Chief of Resource Mgmt:	Carl Zimmerman	ext. 213
Chief of Interpretation	Larry Points	ext. 227
GIS Specialist:	Mark Duffy	ext. 219
USGS Contact:	Jeff Williams, jwilliams@usgs.gov	(793) 648-6511

Biscayne National Park – POC: Patrick Lynch

P.O. Box 1369

Homestead, FL 33090-1369

Chief of Resource Mgmt		(305) 230-1144 ext. 3007
USGS Contact:	Gene Shinn, eshinn@usgs.gov	(727) 803-8747 x3030

Boston Harbor Islands NRA – POC-1: Bruce Jacobson; POC-2: Barbara Mackey

408 Atlantic Avenue, Suite 228

Boston MA 02210-3350

NARO-GMP team:	Barbara Mackey	(617) 223-8666
Project Manager:	George Price	(617) 223-8667

Canaveral National Seashore – POC: John Stiner

308 Julia Street

Titusville, FL 32796-3521

USGS Contact:	John Haines jhaines@usgs.gov	(407) 267-1110 (703) 648-6422
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Cape Cod National Seashore – POC: Nancy Finley

99 Marconi Site Road

Wellfleet, MA 02667

Superintendent:	Maria Burks	(508) 349-3784 ext. 203
Chief, NR Management:	Nancy Finley	ext. 216
USGS Contact:	Jeff List jlist@usgs.gov	(508) 457-2343

Cape Hatteras National Seashore – POC: Keith Watson
 Rt. 1 Box 675
 Manteo, North Carolina (252) 473-2111
 Superintendent: Robert W. Reynolds
 Chief of Resource Mgmt: Steve Harrison
 Natural Resource Specialist: Keith Watson
 Natural Resource Specialist: Marcia Lyons
 USGS Contact: Jeff List jlist@usgs.gov (508) 457-2343
 Rob Thieler rthieler@usgs.gov (508) 457-2350

Cape Lookout National Seashore – POC: Michael Rikard
 131 Charles Street (252) 728-2250
 Harkers Island, NC 28531
 Superintendent: Kaaren Brown
 Resource Mgmt Specialist: Michael Rikard
 USGS Contact: Jeff List jlist@usgs.gov (508) 457-2343
 Rob Thieler rthieler@usgs.gov (508) 457-2350

Colonial National Historical Park – POC: Charles Rafkind
 P.O. Box 210
 Yorktown, VA 23690-0210 (757) 898-2410

Cumberland Island National Seashore – POC: Jenny Bjork (912) 882-4336
 Cumberland Island National Seashore
 P.O. Box 806
 St. Marys, Georgia 31558
 Mainland office: (912) 882-5496
 Island field office: (912) 258-3205
 Superintendent: Denis Davis
 Chief of Resource Mgmt: Jennifer Bjork (912) 882-4336
 USGS Contact: Jack Kindinger, jkindinger@usgs.gov (727) 803-8747

Fire Island National Seashore – POC-1: Mike Bilecki; POC-2: Danette Woo
 120 Laurel Street
 Patchogue, NY 11719 (516) 289-4810
 Superintendent: Constantine Dillon ext. 225
 Chief of Resources Mgmt: Michael Bilecki ext. 234
 Chief of Interpretation: Maria Wagenbrenner ext. 228
 USGA Contact: Bill Schwab bschwab@usgs.gov (508) 457-2299

Fort Matanzas National Monument – POC: Gordon Wilson
 8635 A1A South
 St. Augustine, FL. 32086 (904) 471-0116
 Superintendent: Gordon Wilson
 Chief of Resource Mgmt, VP and Interp: Chuck Dale
 FOMA Site Supervisor: Dave Parker

Fort Pulaski National Monument – POC: Cliff Kevill

P.O. Box 30757

Savannah, GA 31410-0757

(912) 786-5787

Superintendent: John Breen

Chief of Visitor Services: Lance Hatten

Resource Mgmt: Cliff Kevill

Fort Sumter/Fort Moultrie National Monument – POC: Tom Murphy

Chief of Resources Management

1214 Middle Street

Sullivan's Island, SC 29482

(843) 883-3123

Gateway National Recreation Area – POC: John Hnedak

Floyd Bennett Field

Building 69

Brooklyn, NY 11234

(718) 338-3338

Chief of Resources:

(718) 354-4522

USGS Contact: Bill Schwab bschwab@usgs.gov

508-457-2299

George Washington Birthplace National Monument – POC: Rijk Morawe (804) 224-1732

1732 Pope's Creek Road

Virginia 22443

(804) 224-1732

Superintendent: John J. Donahue

ext. 13

Chief of Interp., VP&RM: Larry Trombello

ext. 14

Timucuan Ecological and Historic Preserve – POC: Richard Bryant

13165 Mt. Pleasant Rd

Jacksonville, FL 32225

(904) 221-7567

Superintendent: Barbara Goodman

ext. 10

Chief of Resource Mgmt: Richard Bryant

ext. 15

Chief of Interpretation: Brian Loadholtz

Gulf Coast & Virgin Islands Parks

Buck Island Reef National Monument – POC: Joel Tutein

Danish Custom House, Kings Wharf

2100 Church Street #100

Christiansted, VI 00820-4611

(340) 773-1460

Site Superintendent: Joel Tutein

Chief Resource Mgmt: Zandy Hillis-Starr

USGS Contact: Chuck Holmes cholmes@usgs.gov

(727) 803-8747

De Soto National Memorial – POC: Paul Carson
P.O. Box 15390
Bradenton, Florida 34280 (941) 792-0458
Superintendent: Carol Clark
Chief Resource Mgmt: Vacant

Dry Tortugas National Park– POC: Robert J. Brock
PO Box 6208
Key West, FL 33041 (305)242-7700
Marine Resources Program: Robert J. Brock (305) 242-7848

Everglades National Park – POC: Robert J. Brock
40001 State Road 9336
Homestead, Florida 33034-6733
Superintendent: Richard G. Ring (305) 242-7710
Research Director: Robert A. Johnson (305) 242-7704
Marine Resources Program: Robert J. Brock (305) 242-7848
USGS Contact: Robert Halley rhalley@usgs.gov (727) 893-3100 x3020

Gulf Islands National Seashore – POC: Riley Hoggard (850) 934-2600
1801 Gulf Breeze Parkway
Gulf Breeze, Florida 32561
Superintendent: Jerry A. Eubanks (850) 934-2600
Chief of Resources Mgmt: Hank Snyder (850) 916-3011
Chief of Interpretation: Vacant (850) 934-2618
USGS Contact: Jack Kindinger jkindinger@usgs.gov (727) 803-8747

Jean Lafitte National Historical Park & Preserve – POC: David Muth
365 Canal Street, Suite 2400
New Orleans, LA 70130-1142 (504) 589-3882 x100
Superintendent: Geraldine Smith
Chief Resource Mgmt: David Muth (504) 589-3882 x128

San Juan National Historic Site – POC: Mark Hardgrove
Fort San Cristobal
Norzagaray Street
San Juan, PR 00901 (787) 729-6777
Superintendent: Paul Hartwig
Chief Resource Mgmt: Mark Hardgrove

Padre Island National Seashore – POC: Darrell Echols
PO Box 181300
Corpus Christi, Texas 78480-1300 (361) 949-8173
Superintendent: Jock Whitworth ext. 222
Resource Mgmt Specialist: Darrell Echols ext. 223
USGS Contact: Bob Morton rmorton@usgs.gov (727) 803-8747 x3080
Chris Schenk cschenk@usgs.gov (303) 236-5796

Virgin Islands National Park – POC: Russ Berry
P.O. Box 710 (340) 775-6238
St. John, V.I. 00831
Superintendent: Russ Berry (340) 776-6201
Chief Resource Mgmt: Vacant
USGS Contact: Chuck Holmes cholmes@usgs.gov (727) 803-8747 x3056

Pacific West Parks

American Memorial Park – POC: Karen Gustin
P.O. Box 5198 CHRB
Saipan, MP 96950 (670) 234-7207
Superintendent: Karen Gustin
Chief Resources Mgmt: Chuck Sayon
Chief Interpretation: Chuck Sayon

Cabrillo National Monument/Point Loma Ecological Reserve – POC: Carol Knipper
1800 Cabrillo Memorial Drive
San Diego, CA 92106-3601 (619) 557-5450
Superintendent: Terry DiMattio
Chief Resources Mgmt: Carol Knipper (619) 523-4563
Bonnie Becker (619) 557-7308
Chief Interpretation: Edmond Roberts

Channel Islands National Park – POC: Gary Davis
1901 Spinnaker Drive
Ventura, CA 93001 (805) 658-5707
Superintendent: Tim Setnicka
Chief Resources Mgmt: Kate Faulkner (805) 658-5709
Chief Interpretation: Carol Spears
Chief Scientist: Gary Davis (805) 658-5707
USGS Contact: Guy Cochrane gcochrane@usgs.gov (650) 329-5076
Dave Howell dhowell@usgs.gov (650) 329-5430

Fort Clatsop National Memorial – POC: David Ek
Route 3, Box 604-FC
Astoria, OR 97103-9803 (541) 861-2471
Superintendent: Cindy Orlando
Chief Resource Mgmt: David Ek
Chief Interpretation: Curt Johnson

Golden Gate National Recreation Area – POC: Tamara Williams (415) 556-0560
 Building 201, Fort Mason
 San Francisco, CA 94123
 Superintendent: Brian O'Neill (415) 561-4722
 Chief Resources Mgmt: Terri Thomas (415) 561-4938
 Chief Interpretation: Howard Levitt (415) 561-4759
 USGS Contact: Bonnie Murchey bmurchey@usgs.gov (650) 329-5101
 John Chin jchin@usgs.gov (650) 329-5270

National Park of American Samoa – POC: Peter Craig
 Pago Pago
 American Samoa 96799 (684) 633-7082
 Superintendent: Chuck Cranfield

Olympic National Park – POC: John Wullschleger
 600 E. Park Avenue
 Port Angeles, WA 98362-6757 (360) 452-4501
 Superintendent: David Morris
 Chief Resource Mgmt: Cat Hoffman
 USGS Contact: Brian Atwater batwater@usgs.gov (206) 553-2927
 Mike Fisher mfisher@usgs.gov (650) 329-5158

Point Reyes National Seashore – POC: Bill Shook
 Point Reyes, CA 94956 (415) 663-8522
 Superintendent: Don Neubacher
 Chief Resources Mgmt: Bill Shook (415) 663-8525
 Chief Interpretation: John Dell Osso
 USGS Contacts: Roberto Anima ranima@usgs.gov
 Andrei Sarna-Wojcicki asarna@usgs.gov (650) 329-4930

Redwood National Park – POC-1: Terry Hofstra; POC-2: Vicki Ozaki, ext. 5443
 1111 Second Street
 Crescent City, CA 95531 (707) 464-6101
 Superintendent: Andy Ringgold ext. 5001
 Chief Resources Mgmt: Terry Hofstra ext. 5200
 Chief Interpretation: Cathy Cook ext. 5060
 USGS Contact: Robert McLaughlin rjmcl@usgs.gov (650) 329-4925

San Juan Island National Historical Park – POC: Bill Gleason (360) 378-2240
 P.O. Box 429
 125 Spring St
 Friday Harbor, WA 98250-0429 (360) 378-2240
 Superintendent: Cecily Muldoon
 Chief Resource Mgmt: Bill Gleason

Santa Monica Mountains National Recreation Area – POC: Nancy Andrews

401 Hillcrest Avenue

Thousand Oaks, CA 91360

Superintendent: Art Eck (805) 370-2344

Chief Resources Mgmt: Nancy Andrews (805) 370-2331

Chief Interpretation: Lorenzo Fong (805) 370-2309

USGS Contact: Brian Edwards bedwards@usgs.gov (650) 329-5488

War in the Pacific National Historical Park – POC: Karen Gustin (671) 477-9362

Marine Drive, Asan

P.O. Box FA

Agana, Guam 96932 (671) 477-9362

Superintendent: Karen Gustin

Chief Resource Mgmt: Chuck Sayon

Chief Interpretation: Rose Manibusan

Coastal Hawaii National Park Contacts

Hawaii Volcanoes National Park – POC: Tim Tunison

P.O. Box 52

Hawaii Volcanoes National Park

Hawaii 96718 (808) 985-6000

Superintendent: Jim Martin

Chief of Resources: Tim Tunison

Chief of Interpretation: Dick Rasp

USGS Contact: Maggie Mangan mmangan@usgs.gov (808) 967-8823

Bruce Richmond brichmond@usgs.gov (650) 329-5071

Haleakala National Park – POC: Ron Nagata

P.O. Box 369 Makawao

Maui, HI 96768

Superintendent: Donald Reeser (808) 572-4400

Chief Resources Mgmt: Ron Nagata (808) 572-4490

Chief Interpretation: Carol McNult (808) 572-4450

USGS Contact: Maggie Mangan mmangan@usgs.gov (808) 967-8823

Bruce Richmond brichmond@usgs.gov (650) 329-5071

Kalaupapa National Historical Park – POC: Rick Potts

P.O. Box 2222

Kalaupapa, HI 96742

Superintendent: Dean Alexander (808) 567-6802

Chief Resources Mgmt: Rick Potts ext. 27

USGS Contact: Maggie Mangan mmangan@usgs.gov (808) 967-8823

Bruce Richmond brichmond@usgs.gov (650) 329-5071

Kaloko-Honokohau National Historical Park – POC: Laura Schuster

73-4786 Kanalani St.14

Kailua-Kona, HI 96740

Superintendent: Francis Kuailani (808) 329-6881

Pu'uhonua o Honaunau National Historical Park – POC: Gordon Joyce

P.O. Box 129

Kona, HI 96726

Superintendent: Geraldine K. Bell (808) 328-2326

Chief Resources Mgmt: Gordon Joyce

USGS Contact: Maggie Mangan mmangan@usgs.gov (808) 967-8823

Bruce Richmond brichmond@usgs.gov (650) 329-5071

Pu'ukohola Heiau National Historic Site – POC-1: Ben Saldua; POC-2: Daniel Kawaiaea

P.O. Box 4430

Kawaihae, HI 96743

Superintendent: Daniel Kawaiaea (808) 882-7218

USGS Contact: Maggie Mangan mmangan@usgs.gov (808) 967-8823

Bruce Richmond brichmond@usgs.gov (650) 329-5071

Lakeshore Parks

Apostle Islands National Lakeshore – POC: Julie Van Stappen

Route 1, Box 4

Bayfield, WI 54814

(715) 779-3397

Superintendent: Alford J. Banta

Chief Resource Mgmt: John Scott

Super. Res. Mgmt Spec. Julie Van Stappen

Chief Interpretation: Myra Dec

USGS Contact: Curt Larsen clarsen@usgs.gov (703) 648-6664

Indiana Dunes National Lakeshore – POC: Bob Daun

1100 North Mineral Spring Road

Porter, IN 46304

(219) 926-7561

Superintendent: Dale Engquist

Asst. Superintendent: Garry Traynham

Chief Resource Mgmt: Bob Daum

Chief Interpretation: Julia Holmaas

USGS Contact: Bruce Jaffe bjaffe@usgs.gov (650) 329-5155

Isle Royale National Park – POC: Jack Oelfke
800 East Lakeshore Drive
Houghton, MI 49931 (906) 482-0984
Superintendent: Douglas A. Barnard
Chief Natural Resources: Jack Oelfke
Chief Interpretation: Smitty Parratt
USGS Contact: Bill Cannon wcannon@usgs.gov (703) 648-6345

Pictured Rocks National Lakeshore – POC: Brian Kenner
P.O. Box 40
Munising, MI 49862-0040 (906) 387-2607
Superintendent: Grant Petersen
Chief Resource Mgmt: Brian Kenner
Chief Interpretation: Gregg Bruff
USGS Contact: Curt Larsen clarsen@usgs.gov (703) 648-6664

Sleeping Bear Dunes National Lakeshore – POC: Steve Yancho
9922 Front St.
Empire, MI 49630 (231) 326-5134
Superintendent: Ivan Miller
Chief Ranger: Roger Moder
Chief Interpretation: Neal Bullington
USGS Contact: Bruce Jaffe bjaffe@usgs.gov (650) 329-5155

Voyageurs National Park – POC: Roger Andrascik
3131 HWY 53
International Falls, MN 56649 (218) 283-9821
Superintendent: Barbara West
Chief Resources Mgmt: Roger Andrascik
Chief Res. Protection
& Visitor Education: Jim Hummel
Interpretive Specialist: Carol Maass

Appendix C.1 USGS and NPS Poster Presenters

Jim Allen - USGS / NPS and Jeff List - USGS

Alongshore Variability in Shoreline and Fore-dune Mobility, Fire Island Sea Shore
Ebb Tidal Delta Dynamics, Moroches Inlet, Fire Island Sea Shore
Space and Timescales of Shoreline Change, Cape Cod

Paul Barlow - USGS

Freshwater-Saltwater Interactions Along the Atlantic Coast: A Regional Assessment of the
Ground Water Resources Program, USGS

Walter Barnhardt, Bruce Jaffe et al. - USGS

Landslide Hazards at Sleeping Bear National Lakeshore, MI

Larry Basch – NPS

Coastal Inventory Mapping in Alaska
Intertidal Monitoring Protocol Development
Small Schooling Fish Research
Benthic Habitat Remote Sensing and Mapping

Robert Brock – NPS

Cultural and Natural Resources at Everglades and Dry Tortugas National Parks

Paul Carlson - USGS

Geologic Characteristics of Benthic Biohabitats: Glacier Bay National Park, S.E. Alaska

Guy Cochran - USGS

USGS Benthic Habitat Mapping in The Channel Islands National Park and Marine Sanctuary

Tom Cronin - USGS

Late Holocene Paleoclimatic Variation from the Chesapeake Bay Estuary

John Dingle - USGS

Changes in Selected Monterey Bay Beaches Between the 1982-83 El Nino and 1995

David Fitterman - USGS

Airborne Geophysical Estimation of Water Quality in Everglades National Park

Diane Gese – NPS

Geologist-in-the-Parks Program

Bob Halley -USGS

Sediment Production is Critical to Reef Restoration

Bruce Jaffe, Rob Kayen, Walter Barnhardt, Guy Cochrane, Tom Reiss – USGS

Max Holden, Steve Yanco - NPS

Coastal Landslide Hazards in Great Lakes Parks: Lessons Learned From Two Recent Huge Landslides in the Sleeping Bear Dunes National Lakeshore, Michigan.

Bill Hulslander – NPS

Geophysical Effects of 1998 Winter Storm Events Along Northern Assateague Island

David Muth – NPS

Shoreline Management at Jean Lafitte National Historical Park and Preserve

Vicki Ozaki – NPS

Tsunamis

Ellen Raabe - USGS

Evolution of the Florida Big Bend Wetlands

Abby Sallenger - USGS

Storm Induced Coastal Change to Point Reyes at Assateague National Seashores

Deborah Willard - USGS

Everglades / Florida Bay Restoration Scenarios